Early Detection of Chronic Obstructive Respiratory Disease

CHRONIC OBSTRUCTIVE RESPIRATORY DISEASE is one of the major and most rapidly increasing causes of disability in the United States. By the time dyspnea or reduction in spirographic forced expired volume in one second (FEV_1) develops, the disease has reached an irreversible stage. Diagnosis in the early stages is essential if medical management is to succeed in preventing progressive involvement and associated disability.

Over the past few years, a number of tests have been described which are capable of detecting chronic obstructive respiratory disease at a time when results of less sensitive tests, such as the FEV_1 are normal and the pathological condition is largely confined to the small airways (less than 2 to 3 mm in diameter). These tests include (1) frequency dependence of compliance, (2) forced expiratory flow rates calculated from the middle or terminal portion of the conventional spirogram or flow-volume curve, (3) closing volume and closing capacity (the volume at which airways in dependent lung zones begin to close) and (4) volume of isoflow calculated from maximal expiratory flow-volume curves determined with the patient breathing air and a mixture of 80 percent helium and 20 percent oxygen. Although "frequency dependence of compliance" may be the most sensitive of these tests, it is too invasive and complex for routine use. Of the other tests, the spirographic maximum midexpiratory flow rate is the simplest and the best standardized.

Recently, in more than 200 subjects, radioxenon and radioaerosol inhalation lung imaging was compared with multiple pulmonary function tests and other diagnostic procedures to determine their relative sensitivity in detecting evidence of early obstructive airway disease. Subjects were classified by the presence or absence of chronic obstructive respiratory disease by two chest physicians on the basis of all available data except the radionuclide studies. The radioaerosol procedure showed the greatest sensitivity (84 percent) in the detection of the disease but its specificity was only fair (62 percent) in comparison with flow rates at mid- and low-lung volumes which showed both good sensitivity (74 percent) and specificity (84 percent).

At present it is not possible to predict which person with isolated abnormalities on the newer screening tests for small airways dysfunction will progress to an irreversible and disabling stage of chronic obstructive respiratory disease. Longitudinal epidemiological studies of cohorts carefully defined from the clinical, environmental and physiological standpoint might answer this question. Indices of early obstructive airway disease in cigarette smokers have been found to be reversible following cessation of smoking; this observation may be of value in attempting to persuade some smokers to stop smoking.

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REFERENCES

Hogg JC, Macklem PT, Thurlbeck WM: Site and nature of airway obstruction in chronic obstructive lung disease. N Engl J Med 278:1355-1360, Jun 20, 1968

Macklem PT: Obstruction in small airways—A challenge to medicine. Am J Med 52:721-724, Jun 1972

Ramana L, Tashkin DP, Taplin GV, et al: Radioaerosol lung imaging in chronic obstructive pulmonary disease. Chest 68:634-640, Nov 1975

Transbronchial Lung Biopsy Using a Flexible Fiberoptic Bronchoscope

THE ABILITY to obtain lung tissue without the risks and trauma of thoractomy has been enhanced by the technique of transbronchial biopsy through a flexible fiberoptic bronchoscope. This procedure was originally described using a rigid bronchoscope but now has been adapted to flexible bronchoscopes.

The technique is especially useful in obtaining lung tissue in such disorders as sarcoidosis, interstitial pneumonitis, alveolar cell carcinoma, lymphangitic spread of carcinoma and pulmonary alveolar proteinosis. Proper patient preparation is helpful for optimal collection of specimens. Good suppression of the cough with lidocaine and selection of an involved segment for biopsy, as determined by x-ray studies, are important. The tip of the bronchoscope is passed visually as far as possible. Then biopsy forceps, with jaws closed, are passed peripherally to the pleura under direct fluoroscopic control. They then are withdrawn 2 to 3 cm, opened and advanced until resistance is met. If no unusual chest wall sensations are felt by the patient, he is asked to slowly exhale. At the end of the exhalation, the jaws of the forceps are closed and the forceps removed. Usually a small piece of lung parenchyma and the neighboring bronchus are obtained. Since the specimens are small (1 to 2 mm in diameter), it is best to take

several specimens to insure enough tissue for adequate examination. Fluoroscopy should be used when one attempts to take a biopsy specimen of a well-localized lesion seen on an x-ray film of the chest.

Pneumothorax does occur (in 10 percent of cases, or less), occasionally requiring chest tube insertion. Although significant hemoptysis is rare, bleeding severe enough to require open thoracotomy to resect or ligate the bleeding site has been reported and some fatalities have occurred. Careful attention to technique will limit these problems. Biopsies done in the right middle lobe and lingula have an increased risk of pneumothorax. The procedure is contraindicated in patients with pulmonary hypertension or bleeding disorders. The inability of a patient to cooperate is a distinct disadvantage, but only constitutes a relative contraindication.

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REFERENCES

Andersen HM, Fontana RS: Transbronchoscopic lung biopsy for diffuse pulmonary disease: Technique and results in 450 cases. Chest 62:125-128, Aug 1972

Joyner LR, Scheinhorn DJ: Transbronchial forceps lung biopsy through the fiberoptic bronchoscope. Chest 67:532-536, May 1976

Corticosteroid Aerosols in the Treatment of Asthma

IN PATIENTS with sputum or blood eosinophilia and recurrent attacks of bronchospasm, the use of corticosteroids may be very helpful. Unfortunately, the use of orally given steroids such as prednisone, when taken for other than a short course, may lead to significant systemic side effects. Such problems as a "moon face," prominent bruising, osteoporosis, and adrenal gland suppression are well recognized complications of corticosteroid therapy.

The use of aerosolized steroids in treating asthma is not new. Dexamethasone (Decadron®) has been used as an inhalant for many years. However, the use of dexamethasone as an aerosol also may result in significant systemic side effects.

The aerosol administration of several newer corticosteroid preparations (beclomethasone dipropionate, triamcinolone acetonide and betamethasone valerate) has resulted in the benefits of steroid therapy without adverse systemic effects. In the small doses used, there is no development of significant systemic levels of corticosteroid, and adrenal function is not impaired.

The use of these new steroid aerosols has allowed patients who were dependent on large doses of oral steroids to reduce their dose to a reasonable daily level, for example, less than 10 mg of prednisone per day, and in some cases to an alternate-day regimen, thereby minimizing systemic side effects. Many patients are able to avoid systemic (orally taken) steroids completely by inhaling one of these new preparations.

The only significant adverse effect of these new steroid aerosols has been the occasional development (in approximately 5 percent of patients) of a Candida infection of the oropharynx, which responds to a reduction in dosage of the inhaled steroid along with nystatin (Mycostatin®) mouth rinse or amphotericin B lozenges. Some patients have complained of hoarseness, which improves rapidly after the steroid therapy is stopped. This hoarseness usually can be prevented by rinsing the mouth with water after each use.

In patients who have been receiving steroids for long periods, allergic rhinitis and eczema may recur and adrenal insufficiency may develop as the oral administration of steroids is discontinued. During an exacerbation of bronchospasm, such as with infection or heavy exposure to allergens, a short intensive course of systemic corticosteroids sometimes may be necessary.

Beclomethasone dipropionate (Vanceril®) is now available in cartridge-inhaler form in the United States, and is a significant addition to the therapeutic armamentarium of physicians treating patients with reversible airway obstruction.

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REFERENCES

Brown HM, Storey G, George WHS: Beclomethasone dipropionate—A new steroid aerosol for the treatment of allergic asthma. Br Med J 1:585-590, Mar 1972

Williams MH Jr, Kane C, Shim CS: Treatment of asthma with triamcinolone acetonide delivered by aerosol. Am Rev Respir Dis 109:538-543, May 1974

Cystic Fibrosis

CYSTIC FIBROSIS has been considered primarily a pediatric problem, although approximately 25 percent of patients now survive into their second decade of life. In addition, in some patients overt symptoms of the disease do not appear until young